

Assignment for How To Make Your Own Kinemages

Graphics Assignment

The graphics assignment is to do the Tutorial--How To Make Kinemages using KiNG. Turn in by **emailing your resulting kinemage file**.

This should give you examples of most of the kinds of things you might need to do in making the kinemages for your class project.

The various programs, documentation, and PDB files mentioned are available from the [BCH622 site](#).

This tutorial lets you practice by using KiNG to construct a multi-part kinemage file to illustrate the structural features of ricin (PDB file 2AAI). These instructions lead you through most of the authoring functions for making your own kinemages, including stylistic suggestions on how to choose views, colors, button layouts, ribbons, superpositions, etc. in ways that will help communicate your 3-D ideas effectively. The more specialized functions of rotatable bonds, mutations, and all-atom contacts are referred to a separate later exercise called All-Atom Contacts.

To understand the structure and format of the .kin text files you are producing, and to look up specific features of the kinemage format, see the kinemage file format description document (pdf). If you want to construct a kinemage feature you have seen in a previous example, use a word-processor to look at how it was done in that file and construct yours by analogy.

Neat things to do with KiNG

KiNG allows you to edit your kinemage in certain ways that would otherwise require hand modification with a text editor. A sampling of the available tools:

- Merge existing (sub)groups
- Move lists from one (sub)group to another
- Move subgroups from one group to another
- Create new (empty) groups and subgroups
- Move groups/subgroups/lists from one kinemage to another
- Rearrange the order in which groups and subgroups appear
- Translate, rotate, and scale entire groups/subgroups/lists
- Change the widths of lines and the radii of balls and spheres
- Create a single file that contains multiple kinemages

Most of these tools can be accessed by loading your file into KiNG and selecting the Edit/Edit hierarchy...

KiNG will then display a hierarchical view of the contents of your kinemage. Navigate to the part to be modified, and choose an appropriate command from the Hierarchy window. In particular, many different options can be altered using the button options. Use `cut` and `paste` to relocate and merge things, and use `move up` and `move down` to change the order they appear in.

To edit the properties of single points, Use the "edit point props" option in the Edit-draw-delete dialog box, then click on the point to be edited in the graphics. from the button options and .

To create one file that contains multiple kinemages, start KiNG and use the `File | open` command to open each individual kinemage, in the order in which you wish for them to appear in the final file. If you look in the drop box in the upper-righthand corner of the KiNG window, you should get a list of kinemages (Kinemage 1, Kinemage 2, *etc.*) to choose from. If you made a mistake, select the kinemage to get rid of and choose `File | close` (don't use `File | close all!`). When only the desired kinemages remain open, choose `File | save as` to write all of them to disk. Make sure to give the file a new name -- KiNG is continually under development and could write out a ``damaged'' kinemage, so you don't want to overwrite your originals!

A few other things :

- Rename and rearrange views (`views | Edit saved views`)
- Make your kinemage display a white background, use realistic perspective, or draw all lines as thin by default:
`select Edit | Kinemage_properties...`

KiNG menu "Help" gives access to the "User manual" in a separate window; whole set of useful tools in addition to the those under the other menus; a list of Keyboard shortcuts; and several built-in kinemages that will load into the graphics window just like external files.

Background reading (entirely optional)

On kinemages:

Richardson & Richardson 1992, Protein Sci. **1**: 3

Richardson & Richardson 1994, Trends Biochem. Sci. **19**: 135

Richardson & Richardson 2001, Int. Tables for Cryst. **vol. F**, chapter 25.2.8.:727-730

On ricin:

Rutenber, Robertus, et al. 1991, Proteins **10**: 240, 251, 260